Los Alamos National Laboratory **Environmental Restoration Program** **Standard Operating Procedure**	No: LANL-ER-SOP-01.10 Rev: 0

Waste Characterization

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WASTE CHARACTERIZATION

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WASTE CHARACTERIZATION

1.0 PURPOSE

This procedure describes the development of a strategy for the characterization of all Environmental Restoration (ER) Project wastes at Los Alamos National Laboratory (Laboratory) and the completion of the Waste Characterization Strategy Form (WCSF). ER Project activities that result in the generation of waste include site investigations, corrective actions, and decommissioning activities.

2.0 SCOPE

2.1 Applicability

This procedure is applicable to all wastes generated by the ER Project during the performance of site investigations, expedited cleanups, voluntary corrective actions, closures, or decommissioning activities. All wastes must be characterized. The WCSF (Attachment A) must be completed for each waste type or group of waste types generated during a specific activity.

2.2 Training

Requirements for both waste management coordinators (WMC) and waste generators are indicated in Laboratory Standard LS105-01.0, Waste Management Coordinator Program. Additionally, staff using this procedure must document that they have read and understood this procedure and the other procedures in LANL-ER-SOPs, Section 1.0, General Instructions.

3.0 DEFINITIONS

Acceptable Knowledge (AK). Information that is used for waste characterization in lieu of direct waste sampling and analysis. AK includes process knowledge, previous chemical/analytical results associated with the waste, and site characterization data and information. AK also includes information on the raw materials used in a process or operation, the associated material safety data sheets, the products produced, and the associated waste produced. AK can also include the site history, the start and end dates of an operation, knowledge of the fate of the contaminants in the environment, and a description of all previous and current activities related to a specific site, including field screening.

Waste type. Waste or groups of waste generated at a site that would require different waste characterization strategies. Waste types could include soil, sludge, concrete, asphalt, metal, wood, personal protective equipment (PPE), discarded equipment, purged groundwater, and decontamination liquids.

4.0 CAUTIONS AND BACKGROUND

Accurate waste characterization is required by disposal facilities because they must meet their permitting requirements. This procedure must be followed for proposing a strategy to characterize waste that will be generated. The strategy proposed will provide CST-5 with adequate information to be assured that the wastes meet their waste acceptance criteria and permitting requirements.

Characterization strategy is a commitment to use a compilation of information to characterize an individual waste type. The information can be AK, direct sampling, or a combination of AK and sampling results. AK can include information that will be generated as a result of site characterization.

AK is of limited value in characterization of ER wastes because much ER-generated waste comes from earlier periods when activities and areas were incompletely documented or their locations not accurately recorded. Additionally, interview information has not been entirely satisfactory for identifying sources of waste because hearsay and memories are not always accurate.

AK has proved useful for background and in initial determinations. Also, AK may be useful in determining whether a constituent is a source-specific waste. If an interviewee is available, the Interview Checklist (Attachment B) must be used if waste constituents are found to be present but the source of the constituent has not yet been identified. If F- or K- listed constituents are detected in the waste, the generator can either assume that the wastes are Resource Conservation Recovery Act (RCRA)-hazardous, or use the Interview Checklist, if warranted, to document that the waste is not hazardous.

Note: The Waste Characterization Strategy Form must be completed and approved before wastes are generated.

5.0 EQUIPMENT

N/A

6.0 PROCEDURE

6.1 Characterization of Wastes

All wastes must be characterized, and a characterization strategy must be approved before the generation of wastes. ER Project waste contaminants are primarily radionuclides or RCRA-regulated constituents. However, if other contaminants are present, (i.e., asbestos, PCB, special wastes, etc.) the waste generator is expected to provide adequate characterization for these

constituents as well. CST-5 for assistance if another type of waste contaminant is suspected to be present.

6.1.1 Radioactive Wastes

The waste characterization strategy must be proposed on the WCSF and approved for potential radioactive wastes before wastes can be generated or the sites remediated. If history and investigation indicate that radioactivity is not present in a waste, then that waste can be managed as nonradioactive.

If radioactive contamination is suspected or known to be present, the strategy for waste characterization must address the amount and types of radioactivity present. Wastes can be characterized based on previous sample results, field screening, sampling, AK, or a combination of these methods.

Wastes having surface or volume radioactive contamination, or that are potentially contaminated from radioactivity, must be characterized. AK can be used as the first determination, for instance, if the area is known to be contaminated. Field screening can be used in some instances to make an interim or final determination using LANL-ER-SOP-10.07, R1, Field Monitoring for Surface and Volume Radioactivity.

Sample results from investigation studies, together with field screening, may be adequate for characterization for volume contamination. The site-specific WMC must be in contact with CST-5 personnel to ensure adequacy of information. Sampling may be required for volume contamination. A consistent and documented approach must be used to evaluate radiochemical results.

6.1.2 RCRA Wastes

Waste characterization strategy must be proposed and approved on the WCSF before the wastes can be generated or remediated. AK can be used to make the RCRA determination if there is enough information to determine the source of contamination.

Listed Hazardous Wastes. The waste and its source must first be evaluated to determine if it is a possible listed waste. If the source is any of the following, the waste is listed:

- 40 CFR 261.31, Hazardous wastes from non-specific sources (F-listed)
- 40 CFR 261.32, Hazardous wastes from specific sources (K-listed)

- 40 CFR 261.33, Discarded commercial chemical products (P- and U-listed)

(See Attachment C for a list of the hazardous wastes that could be generated by the ER Project, based on the Laboratory site history and the processes generating these wastes that make them subject to the RCRA requirements. Discarded chemical products are not included in this listing.)

Characteristic Hazardous Wastes. If the waste is not a listed waste, the waste must be evaluated as a possible characteristic hazardous waste identified in 40 CFR 261.21 through 24. Usually, AK can be used to characterize the characteristics of ignitability, corrosivity, and reactivity (except for high explosives) to eliminate from consideration in ER sites' waste types, but the wastes must be evaluated for constituents in the toxicity characteristic (TC) category.

Process knowledge can be used to evaluate the liquid ER wastes, such as decontamination solutions or purged groundwater. Most liquids would not exhibit corrosive, reactive, ignitable, or toxic characteristics. If the materials come from highly contaminated areas, laboratory analyses may be required.

A number of the TC wastes, especially barium, cadmium, lead, mercury, and silver (to name a few), are known or suspected to be present in the soils at ER sites and are identified in the site-specific work plans. A waste must be designated as a hazardous waste if the toxicity characteristic leaching procedure (TCLP) analyses indicate that RCRA TC regulatory levels are equaled or exceeded. (See Attachment D for a listing of the TC or D-listed wastes and the maximum allowable regulatory levels.)

As an alternative to TCLP, total metal analyses can be used to demonstrate that the waste is not a TC hazardous waste. The total analyses of solid samples can be compared with the TC levels. If the total analyses indicate that levels of the contaminant are <20 times the TC levels, the material is characterized as not hazardous.

6.2 Completion of the Waste Characterization Strategy Form

The WCSF must be completed for all ER wastes. The field unit-specific WMC will assist with the completion of this form. The first and last pages of the WCSFs must be completed only once per waste type originating from a single or combination of potential release sites (PRSs) or solid waste management units (SWMUs). These pages give general information. The remaining pages

that give the actual characterization strategy for each waste type must be completed for each type of waste (PPE, decontamination water, contaminated soil, etc.). The specific waste type pages may be duplicated the required number of times to address all waste types. After the form is complete, number the upper right hand corners, including the first and last pages, to ensure that the reviewer has had access to all pages.

The WCSF that is used in this procedure has been modified from the original Solid Radioactive Waste Management Group's (CST-14) form that was presented in their document "Justification of Characterization Strategy for Wastes Generated by the Environmental Restoration Project." The form in this procedure satisfies CST-14's requirements for characterization strategy.

The instructions for completing the form in Attachment A are in Sections 6.2.1 through 6.2.11.

6.2.1 Identification Boxes

Complete the identification for

- Operable Unit
- Field Unit
- PRS/SWMU Number(s)
- Title (of the PRS/SWMU)
- Waste Types (soil, water, PPE, sanitary landfill trash, etc.)
- Date of Completion of Form
- Name of Field Project Leader
- Name of the Field Unit Waste Management Coordinator
- Type of Activity (investigation, corrective action, expedited cleanup, decommissioning projects)

6.2.2 Description of the ER Project Activity

Describe the ER activities that will be generating the waste to be addressed in this form. Activities can include drilling, sampling, excavation, pumping, and decommissioning. Be sure to include such things as decontamination activities and activities that generate uncontaminated waste.

6.2.3 Acceptable Knowledge

Any available background information can help characterize the waste. Knowledge of the source of the waste is required to adequately characterize some wastes.

A. Provide a site description and history, including dates of operation, types of work conducted, chemicals used at the site, and waste types and management.

B. Note if previous analytical results for the expected wastes are available, and include results showing contaminants above background levels and sampling method, if known.

Unless the information is very specific (for instance, containers of known liquids or bags of pesticides), AK will not be satisfactory without sampling results. If sampling information indicates the presence of contaminants of unknown origin, the Interview Checklist, Attachment B, may be used if interviewees are available.

6.2.4 Specific Waste Type

Indicate the specific waste type for which this section is being written: contaminated soil, decontaminated PPE, waste destined for the sanitary landfill, etc. Each different waste type should have its own section of the strategy form completed, even though all the waste types are indicated on the first page of the form. Segregation of the waste types is assumed at this point. Be sure that the specific waste type is identified.

6.2.5 Waste Description

Describe the physical types of waste expected: water, contaminated indigenous material, PPE, borehole cuttings, etc. Identify hazardous or radioactive contaminants that are known or potential, and estimate volumes of each waste type. Indicate the waste packaging that will be used: 55-gal. drums, roll-off bins, B-25 boxes, etc. This information could be prepared in a table format and included with the WCSF.

6.2.6 Characterization Strategy

Techniques for characterizing the specific waste type must be identified in this portion of the form. Techniques can include

- chemical analysis;
- results from previous analyses;

- field screening; and
- interviews.

All methods of characterization for the specific waste type must be identified. For instance, PPE may be characterized based on soil sample results taken at the site, by decontamination after field screening, or by knowledge of process (i.e., the PPE never came in contact with contaminated material). Trash bound for the municipal landfill can be characterized based on the fact that it was outside the contaminated zone and never contacted the contaminated material.

For bulk contaminated soil, the method of sampling and the analytical results used for characterizing the waste must be identified. A justification that these results are representative must be provided, or the worst-case scenario from a regulatory perspective must be assumed.

If direct sampling of containerized waste will be used for the characterization strategy, indicate how many grab or composite samples will be taken. Grab and composite samples must be taken appropriately for the media. Grab samples are appropriate for homogenous wastes, such as water. Composite samples are appropriate for heterogeneous wastes; the number of subsamples for a composite sample must be statistically defensible. Contact the WMC for assistance regarding subsample criteria. Samples collected for volatile organic compounds must be grab samples. Be sure to collect enough samples to provide a representative concentration of constituents.

6.2.7 Analytical Strategy

This section of the form is used to identify contaminants or potential contaminants and the methods that will be used to characterize them.

A. For the specific waste type, indicate if the constituent is present, not present, or no information is available.

B. In the three columns to the right of the double bar, check only one strategy method. If AK, either existing or from data to be taken, is sufficient for disposal purposes, direct sampling of the containerized waste may not be necessary.

C. If direct sampling is indicated, indicate the analytical method that will be used for the samples required.

D. If samples are to be taken, indicate the analytical method that will be used for the analysis in the first column. Ensure that the samples are analyzed by SW-846 or other approved analytical methods

6.2.8 Potentially Radioactive Wastes

Indicate the potential radioactive status of the waste. If the area is known to be contaminated from AK, field screening, or earlier sample results, indicate the type and activity, if known, of potential contamination.

If tritium is not expected to be in the waste and the waste will not be sampled for tritium, attach a statement signed by the FPL stating that, based on a review of available information and professional judgment, it is not necessary to sample for tritium at this site because there is no potential for the waste to contain added tritium due to DOE operations.

6.2.9 Preliminary RCRA Determination

Use this block to identify the status of knowledge regarding RCRA contaminants and radioactive contamination. Make sure to address each category as noted. If RCRA contaminants are identified, the waste is a RCRA waste and must be managed in accordance with all requirements. The site history and existing screening and sample results must be reviewed to identify radionuclides and possible activities.

If the waste has been shown to be non-RCRA, check the first box and give a description of how the waste will be managed. If the waste is potentially RCRA, it **must** be managed as RCRA.

If the waste is RCRA or potentially RCRA, check the second box. If sample results indicate that waste previously identified as potentially RCRA is not RCRA, then the waste can be relabeled and managed as non-RCRA. This change must be indicated in the Field Log Book or the Daily Activity Log.

6.2.10 Review and Signatures

The Field Team Leader and Field Team WMC must sign the completed WCSF and forward it to the Waste Management Representative at CST-5 and the ESH-19 RCRA Liaison for review and comment. When comments have been satisfactorily incorporated, obtain the approval signature of the Waste Management Representative. Forward a copy of the approved WCSF to the ER Project WMC.

6.2.11 Amendments and Deviations

If additional information is obtained after the WCSF is approved that would affect the proper characterization of the waste, the WCSF must be

amended. Additional information may include analytical results that were unavailable at the time the form was completed, field observations and screening results, etc. Start numbering the amendment pages with A-1, A-2, etc. Submit the amendment to Waste Services, CST-5, for approval.

If the WCSF was not followed, write a letter to the PRS file that describes the deviations, and forward copies to the ER Project WMC and to Waste Services.

7.0 REFERENCES

EPA (US Environmental Protection Agency), July 1,1994. Code of Federal Regulations, Title 40, Environment; Subchapter I, Solid Wastes, Washington, DC

Los Alamos National Laboratory, Laboratory Standard LS105-01.0, Waste Management Coordinator Program, April 4, 1995.

Los Alamos National Laboratory, Justification of Characterization Strategies for Wastes Generated by the Environmental Restoration Project, AP-CST14G-004, Rev. 1, CST-14.

Los Alamos National Laboratory Environmental Restoration Project, LANL-ER-SOP-01.06, R1, Waste Management.

Los Alamos National Laboratory Environmental Restoration Project, LANL-ER-SOP-10.07, Field Monitoring for Surface and Volume Radioactivity Levels.

8.0 RECORDS

The Field Project Leader must ensure that all records generated while following this procedure are transmitted to the ER Records Processing Facility. The following records are generated, as applicable, during waste characterization:

- WCSF
- Amendments to the WCSF
- Interview Checklist
- Sampling Plan

Additionally, the Field Project Leader must ensure that the WCSF is attached to the Waste Profile Form associated with the same waste type and is transmitted to CST-14 for the Waste Management Program's official records.

9.0 ATTACHMENTS

Attachment A – Waste Characterization Strategy Form
Attachment B – Interview Checklist
Attachment C – F- and K-Listed Wastes and Process Description
Attachment D – D-Listed Wastes with Maximum Concentration of Contaminants for Toxicity Characteristic

WASTE CHARACTERIZATION STRATETY FORM

OU Number/FU	PRS/SWMU Number	Title
All Waste Types or Wastestreams:		

Completed By:	Date:
FPL:	WMC:
Type of Activity (site investigation, EC, etc.):	

Description of the Activity (e.g., drilling, surface sampling, excavation and recontouring, soil washing, etc.)

Acceptable Knowledge

Site Description, Site History, and Historical Waste Generating Processes or Activities: (Include dates for site history):

Previous Investigation Analytical Results: (Report the analytical methods and results above background levels)

WASTE CHARACTERIZATION STRATETY FORM

OU Number/FU	PRS/SWMU Number	Title

Specific Waste Type:

Waste Description

Description of Waste Type, Potential Contaminants, Volume Estimate, and Waste Packaging:

Characterization Strategy

Description of Strategy:

Waste Sampling*: (If sampling will be used, indicate how many grab or composite samples will be collected per container or volume of waste and whether the waste is considered homogeneous or heterogeneous.)

* Grab sampling is appropriate for wastes that are fairly homogeneous, such as liquid wastes.
Composite sampling is appropriate for wastes that are heterogeneous, such as soil, sediment, and debris.

Analytical Strategy

Analyte Category	Analytical Method	May be Present (yes, no, unknown)	Direct Sampling of Containerized Waste	Acceptable Knowledge Existing Information	Acceptable Knowledge Data from Proposed Site Characterization
Volatile Organic Constituents					
Semivolatile Constituents					
Organic Pesticides					
Organic Herbicides					
Pesticides and PCBs					
PCBs					

WASTE CHARACTERIZATION STRATETY FORM

OU Number/FU	PRS/SWMU Number	Title
Specific Waste Type:		

Analytical Strategy (Continued)

Analyte Category	Analytical Method	May be Present (yes, no, unknown)	Direct Sampling of Containerized Waste	Acceptable Knowledge Existing Information	Acceptable Knowledge Data from Proposed Site Characterization
Total Metals					
Total Cyanide					
Other Inorganic Constituents (specify)					
High Explosive Constituents					
Asbestos					
TPH					
TCLP Metals					
TCLP Organics					
TCLP Pesticides and Herbicides					
Gross Alpha					
Gross Beta					
Gross Gamma					
Tritium[1]					
Gamma Spectroscopy					
Isotopic Plutonium					
Total Plutonium					
Isotopic Uranium					
Total Uranium					
Strontium-90					
Americium-241					

[1] If tritium is not expected, attach a statement signed by the FPL stating that, based on a review of the available information and professional judgment, it is not necessary to sample for tritium at this site.

WASTE CHARACTERIZATION STRATETY FORM

OU Number/FU	PRS/SWMU Number	Title

Specific Waste Type:

Preliminary RCRA Determination

Based on available information, indicate the waste and whether it could potentially be any of the wastes as defined in 40 CRF 261. List the F-, D-, K-, P-, or U- category and number.

Preliminary RCRA Status

____ Non-RCRA: (No 90-Day Storage Requirement)
Describe how waste will be stored/handled:

____ RCRA: (90-Day Storage Requirement)
Waste will be stored/handled in accordance with 20 NMAC Generator Requirements

Preliminary Determination for Radioactivity

Based on available information, indicated the amount and type of radiation contamination expected in the waste.

Preliminary Radioactivity Status

_____ Material is not radioactive
Describe how waste will be stored/handled

_____ Material is radioactive
Describe the controlled area, labeling, and protection against inadvertent contamination

WASTE CHARACTERIZATION STRATETY FORM

OU Number/FU	PRS/SWMU Number	Title
Waste Types or Wastestreams:		

Signatures:

Field Team Leader _____

Field Team Waste Management Coordinator _____

Waste Management Representative _____

ATTACHMENT A-1

TETRACHLOROETHYLENE
tetrachloroethene
perchloroethylene
ethylene tetrachloride
Nema
Tetracap
Tetropil
Perclene
Ankilostin
Didakene

TRICHLOROETHYLENE
trichloroethene
ethinyl trichloride
Tri-Clene
Trielene
Trilene
Trichloran
Trichloren
Algylen
Trimar
Triline
Tri
Trethylene
Westrosol
Chlorylen
Gemalgene
Germalgene

METHYLENE CHLORIDE
dichloromethane
methylene bichloride

1,1,1-TRICHLOROETHANE
methylchloroform
chlorothene

CARBON TETRACHLORIDE
tetrachloromethane
perchloromethane
Necatorina
Benzinoform

CHLORINATED FLUOROCARBONS
all *liquid* freons

CHLOROBENZENE
monochlorobenzene
benzene chloride

1,1,2-TRICHLORO-1,2,2
-TRIFLUOROETHANE

ORTHO-DICHLOROBENZENE
1,2-dichlorobenzene

TRICHLOROFLUOROMETHANE
trichloromonofluoromethane
fluorotrichloromethane
Freon 11
Frigen 11
Arcton 11

1,1,2-TRICHLOROETHANE
vinyl trichloride

XYLENE
dimethylbenzene
Xylol

ACETONE
2-propanone
dimethyl ketone
β-ketopropane
pyroacetic ether

ETHYL ACETATE
acetic acid ethyl ester
acetic ether
vinegar naptha

ETHYLBENZENE

ETHYL ETHER
1,1'-oxybisethane
ethoxyethane

ether
diethyl ether
ethyl oxide
diethyl oxide
sulfuric ether
anesthetic ether

METHYL ISOBUTYL KETONE

n-BUTYL ALCOHOL
1-butanol
butyl alcohol
propyl carbinol

CYCLOHEXANONE
ketohexamethylene
pimelic ketone
Hytrol O
Anone
Nadone

METHANOL
methyl alcohol
carbinol
wood spirit
wood alcohol

CREOSOLS
cresylic acid
cresylol
tricresol
ortho-creosol
2-methylphenol
o-hydroxytoluene
meta-creosol
3-methylphenol
para-creosol
4-methylphenol

NITROBENZENE
nitrobenzol
essence of mirbane
oil of mirbane

TOLUENE
methyl benzene
toluol
phenyl methane
Methacide

METHYL ETHYL KETONE
2-butanone
ethyl methyl ketone
MEK
2-oxobutane

CARBON DISULFIDE
carbon bisulfide
dithiocarbonic anhydride

ISOBUTANOL

PYRIDINE

BENZENE
benzol
cyclohexatriene

2-ETHOXYETHANOL
ethylene glycol monoethyl ether
Cellosolve
Oxitol

2-NITROPROPANE

Page 1
___ ___ ___ - ___ ___*

Attachment B

Interview Checklist to Help Determine RCRA Status of Wastes

All questions are to be answered. Use No Known Information (NKI) as responses to questions if the interviewee has no information on the subject matter. Put the interviewer's initials and the number of the interviewer's completed checklist in the identifier location at the right hand corner of the cover page and on each succeeding page. Follow all instructions in the checklist, and give the entire record package to the Field Team Leader.

The Field Team Leader or designee will submit the record package to the Environmental Restoration Project's waste management liaison for delivery to ESH-19 for the RCRA determination. The record will be submitted to the RPF in accord with Section 7.0 of this AP.

1.	Name of Interviewee:	Date:
2.	Interviewee's Z Number:	
3.	Interviewee's Address (if retired):	
4.	Phone: (w) (___)_____ (h) (___)_____	
5.	Names of other personnel involved with work at the site. Addresses and phone numbers, if available:	
6.	Name of Interviewer (Print and sign name):	Date:

*Use interviewer's initials before dash, and put number of interview after dash.
☐Check here if information continues on the back.

Attachment B

Interview Checklist to Help Determine RCRA Status of Wastes

Date of Interview: _____
PRS or SWMU Designation: OU:
TA ___ Building _____ (if applicable)
Interviewee's dates of service at site:
Job title and brief description of interviewee's work:

RCRA characteristic wastes will not be addressed in this checklist, because the purpose of the checklist is to obtain information about potential RCRA listed constituents.

Environmental Restoration Project's policy is to obtain the best available information to help ESH-19 determine if a constituent identified from analysis is a RCRA listed waste. Information about the uses of the constituent is important for correct characterization. Use of this checklist will help obtain relevant information. The only RCRA waste codes considered likely by ESH-19 to occur at this laboratory are:

Solvents	F001 - F005
Electroplating	F006 - F012
Leachate from multi source	F039
Explosive Manufacturing	K044 - K047
Lead, hexavalent chromium - from formulation of ink	K086
Off Specification or Spilled Chemicals	P and U

Attachment A-1 of this checklist gives technical and trade names for F001-F005 Constituents. List the chemicals and potential RCRA waste codes that are being researched.

Chemical name (also use common name, if one exists)	Potential RCRA Waste Codes (from above list)
_____	_____
_____	_____
_____	_____
_____	_____

*Use interviewer's initials before dash, and put number of interview after dash.
☐Check here if information continues on the back.

Attachment B

Interview Checklist to Help Determine RCRA Status of Wastes

QUESTIONS
1. Describe activity and waste-generating process. Include information on raw materials used, process, product, rework. Include dates of activity. Diagram or sketch, if it would be helpful.
2. Facility history. (Dates of interviewee's service at facility): Group's Designation or Name/Group responsible for facility use. Mission:
3. Were there chemistry labs, machine shops, maintenance shops, or mechanical repair shops where you worked? A. Were degreasers, solvents, or non-soap type cleaners used? B. What degreasers or solvents were used? Also include concentration of chemicals prior to use. (*Use list of chemicals in Attachment A to help interviewee recognize chemicals.*) C. How were they used? D. What was done with the spent cleaners, still bottoms, or chemicals? (*Please list each one separately, if possible.)* E. How was the waste managed? (Where was it stored?) F. Where was it disposed? (*Give interviewee map of Technical Area to identify disposal location.*) G. Were any chemicals used for degreasing or cleaning also used for other purposes? Can examples of these other uses be given?

*Use interviewer's initials before dash, and put number of interview after dash.
☐Check here if information continues on the back.

Attachment B

Interview Checklist to Help Determine RCRA Status of Wastes

4. Were there electroplating operations using cyanides? Describe the processes, what was plated, and the raw materials.

   A. What was done with the plating solutions, residues, stripping baths or cleaning baths? (*Please list each one separately if possible.*)

   B. Where and when were solutions or residues disposed? (*Give interviewee map of Technical Area to identify disposal location.*)

      i. Did wastewater treatment occur at this site?
      ii. What was done with the wastewater treatment sludges?

   C. Were wastewater treatment sludges generated from sulfuric acid anodizing of aluminum; tin plating on carbon steel; zinc, aluminum, or zinc-aluminum plating on carbon steel; cleaning or stripping of zinc, aluminum, or tin on carbon steel; or chemical etching or milling of aluminum?

   D. Where did the treatment occur? How was the waste managed?

   E. Where and when was the waste disposed?

   F. Were cyanides used other than for electroplating operations? Can examples of such uses be given?

5. Were there metal heat treating operations using cyanides where you worked? Describe the processes, raw materials, and the product.

   A. What was done with the quenching bath residues from oil baths or spent cyanide solutions from salt bath pot cleaning? (*Please list separately, if possible.*)

      i. Did wastewater treatment occur at this site?
      ii. What was done with the wastewater treatment sludges?

   B. Where and when were the sludges disposed?

   C. Were cyanides used other than for heat treating operations? Can examples of such uses be given?

6. A. Were explosives manufactured or produced?

   B. Was wastewater from this explosives work generated or treated?

   C. Describe the processes, raw material, and the products.

*Use interviewer's initials before dash, and put number of interview after dash.
☐Check here if information continues on the back.

Attachment B

Interview Checklist to Help Determine RCRA Status of Wastes

6.	D.	What was done with the pink/red water, sludges or spent carbon from explosives wastewater treatment? (*Please list separately, if possible.*)
	E.	Where and when were these materials disposed?
7.	A.	Were any unused chemicals (including pesticides and insecticides) that were unwanted, out of date, or off specification disposed?
	B.	What were the chemicals' names and uses?
	C.	Where and when were they disposed?
		i. Were there any spills (e.g., in storage areas) from any unused chemicals? ii. What was done with the cleanup materials?
	D.	Were there any other incidents that may have caused contaminants to be deposited on the soil?
8.	A.	Was there a landfill for chemicals in or near your work area? _____ Where?
		i. Were there liquids associated with the landfill?
		ii. Were the liquids in the bottom or below the pit ever collected for further processing or management?
	B.	What was done with the liquids and where were they disposed?
9.	A.	Were there printing operations on site?
	B.	What was done with the liquids and sludges from the type-cleaning operations?
10.	A.	Were there other waste generating processes in the vicinity that might have an impact on this site?
	B.	Who would have details about the process or practice?

*Use interviewer's initials before dash, and put number of interview after dash.
☐Check here if information continues on the back.

Attachment B

Interview Checklist to Help Determine RCRA Status of Wastes

11. A. Were other chemicals used at the site? What were their uses?

B. Were other wastes (for example, vacuum pump oil or other oils) managed or disposed at the site?

12. Method of disposal

- ☐ Into drain (indicate destination, if known)
- ☐ Into holding tank
- ☐ Evaporation
- ☐ Spill (chemical storage or waste storage area?)
- ☐ Poured onto or injected into ground
- ☐ Buried (for example in Material Disposal Area or buried in place)
- ☐ Burned

Explain checked boxes:

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13. Was waste packaged?

Describe:

*Use interviewer's initials before dash, and put number of interview after dash.
☐Check here if information continues on the back.

Attachment B

Interview Checklist to Help Determine RCRA Status of Wastes

14. Is other information available?

- ☐ Letters/Memos
- ☐ Ordering Information
- ☐ Transportation/shipping information
- ☐ Final Report

Give available detail on checked items:

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15. To Interviewer: If no information is available, briefly relate the effort to deterine information (for example, phone calls, letters, archival research, etc.):

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*Use interviewer's initials before dash, and put number of interview after dash.
☐Check here if information continues on the back.

Attachment C

F- and K- Listed Wastes and Process Description

EPA CODE	PROCESS DESCRIPTION
F001	The following spent halogenated solvents used in degreasing: tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of 10 percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures
F002	The following spent halogenated solvents: tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane; all spent solvent mixtures/blends containing, before use, a total of 10 percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures
F003	The following spent non-halogenated solvents: xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above non-halogenated solvents, and, a total of 10 percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures
F004	The following spent non-halogenated solvents: cresols and cresylic acid, and nitrobenzene; all spent solvent mixtures/blends containing, before use, a total of 10 percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures
F005	The following spent non-halogenated solvents: toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane; all spent solvent mixtures/blends containing, (before use) a total of 10 percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these spent solvents and spent solvent mixtures
F006	Wastewater treatment sludges from electroplating operations except from the following processes: (1) Sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum

Attachment C

F- and K- Listed Wastes and Process Description

EPA CODE	PROCESS DESCRIPTION
F007	Spent cyanide-plating bath solutions from electroplating operations; cyanide (salts)
F008	Plating bath residues from electroplating operations where cyanides are used in the process; cyanide (salts)
F009	Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process; cyanide (salts)
F010	Quenching bath residues from oil baths from metal heat-treating operations where cyanides are used in the process; cyanide (salts)
F011	Spent cyanide solutions from salt bath pot cleaning from metal heat-treating operations; cyanide (salts)
F012	Quenching wastewater treatment sludges from metal heat-treating operations where cyanides are used in the process; cyanide (complex)
K044	Wastewater treatment sludges from the manufacturing and processing of explosives. (Only a listed hazardous waste when reactivity characteristic is exhibited.)
K045	Spent carbon from the treatment of wastewater containing explosives. (Only a listed hazardous waste when reactivity characteristic is exhibited.)
K046	Wastewater treatment sludges from the manufacturing, formulation, and loading of lead-based initiating compounds; lead
K047	Pink/red water from TNT operations. (Only a listed hazardous waste when reactivity characteristic is exhibited.)

Attachment D

D-Listed Wastes with Maximum Concentration of Contaminants for the Toxicity Characteristic

EPA HW No.	Contaminant	Regulatory Level (mg/L)
D004	Arsenic	5.0
D005	Barium	100.0
D018	Benzene	0.5
D006	Cadmium	1.0
D019	Carbon tetrachloride	0.5
D020	Chlordane	0.03
D021	Chlorobenzene	100.0
D022	Chloroform	6.0
D007	Chromium	5.0
D023	o-Cresol	200.0
D024	m-Cresol	200.0
D025	p-Cresol	200.0
D026	Cresol	200.0
D016	2,4-D	10.0
D027	1,4-Dichlorobenzene	7.5
D028	1,2-Dichloroethane	0.5
D029	1,1-Dichloroethylene	0.7
D030	2,4-Dinitrotoluene	0.13
D012	Endrin	0.02
D031	Heptachlor (and its epoxide)	0.008
D032	Hexachlorobenzene	0.13
D033	Hexachlorobutadiene	0.5
D034	Hexachloroethane	3.0

Attachment D

D-Listed Wastes with Maximum Concentration of Contaminants for the Toxicity Characteristic

EPA HW No.	Contaminant	Regulatory Level (mg/L)
D008	Lead	5.0
D013	Lindane	0.4
D009	Mercury	0.2
D014	Methoxychlor	10.0
D035	Methyl ethyl ketone	200.0
D036	Nitrobenzene	2.0
D037	Pentrachlorophenol	100.0
D038	Pyridine	5.0
D010	Selenium	1.0
D011	Silver	5.0
D039	Tetrachloroethylene	0.7
D015	Toxaphene	0.5
D040	Trichloroethylene	0.5
D041	2,4,5-Trichlorophenol	400.0
D042	2,4,6-Trichlorophenol	2.0
D017	2,4,5-TP (Silvex)	1.0
D043	Vinyl chloride	0.2